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REMD SECTION

Ms. Alice C. Fuerst
Remedial Project Manager, Superfund Branch
Region VII Environmental Protection Agency
726 Minnesota Avenue
Kansas City, KS 66101



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SUPERFUND RECORDS

Dear Alice,

This issue of the AMC Journal just crossed my desk and I thought you may be interested in the articles on mining waste management. The picture on page 7 could be of the Galena area, if all works well.

How is the proposal for the Galena subsite coming? I've done some more thinking about Alternate 3, and the largest question in my mind is the effectiveness of the plugs. I don't believe, in that karst topography and with the type of material planned for use, that the plugs will be very effective. I'd like to hear your thoughts and those of CH2M-Hill now that there has been a couple weeks to think about it.

My idea of forming a barrier around the area by blasting down the overburden and then backfilling with low-permeability material may yet work if it were combined with Alternate 3. Backfilling, followed by blasting down the overburden, followed by injection of cementing or sealing material would do the best job of slowing ground water flow at the 3 locations of concern. This way you know you have sealed off the area as the plug extends all the way to the surface.

The same approach could be used to slow down groundwater flow into the Galena area, by installing backfill-blast-inject plugs upstream, near the Missouri line. However, I would expect the water to simply flow around the plugs and return to its original course, the path of least resistance.

I know that reducing the mined-out area permeability to that of the undisturbed strata is the ideal goal. However, given the type of topography existing there, it doesn't seem that even reaching that goal will be enough. I believe the major factor is diversion of surface waters and, if possible, diversion of incoming groundwater. These diversions will do more to reduce the heavy metals problem than any other part of Alternate 3. Diversion plus recontouring will do the most good, given the cost restrictions.

I have also done some checking into reclamation costs and found that it would not be unusual to spend \$6000-8000 per acre for successful reclamation, including the recontouring, given the conditions in the Galena area. It would be interesting to contact St. Joe Minerals (picture on page 7) and get their cost breakdown and original conditions. Actually, the property belongs to the state of Missouri, so you should be able to get the information easily.

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Has any more thought been given to testing some of the samples taken in the Galena area? Before we rely too heavily on being able to reduce the metal content by 85%, we had better test the material to see if it responds to flotation--under what conditions and to what extent can we remove the metals and produce a good residual tailing? The Bureau would be in a position to do this testing at, I believe, a reasonable cost.

Just a few ideas for your consideration. Keep me posted on your progress and the meeting schedule.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dave".

David L. Veith, P.E.
U.S. Bureau of Mines
5629 Minnehaha Avenue South
Minneapolis, MN 55417

AMRE Journal

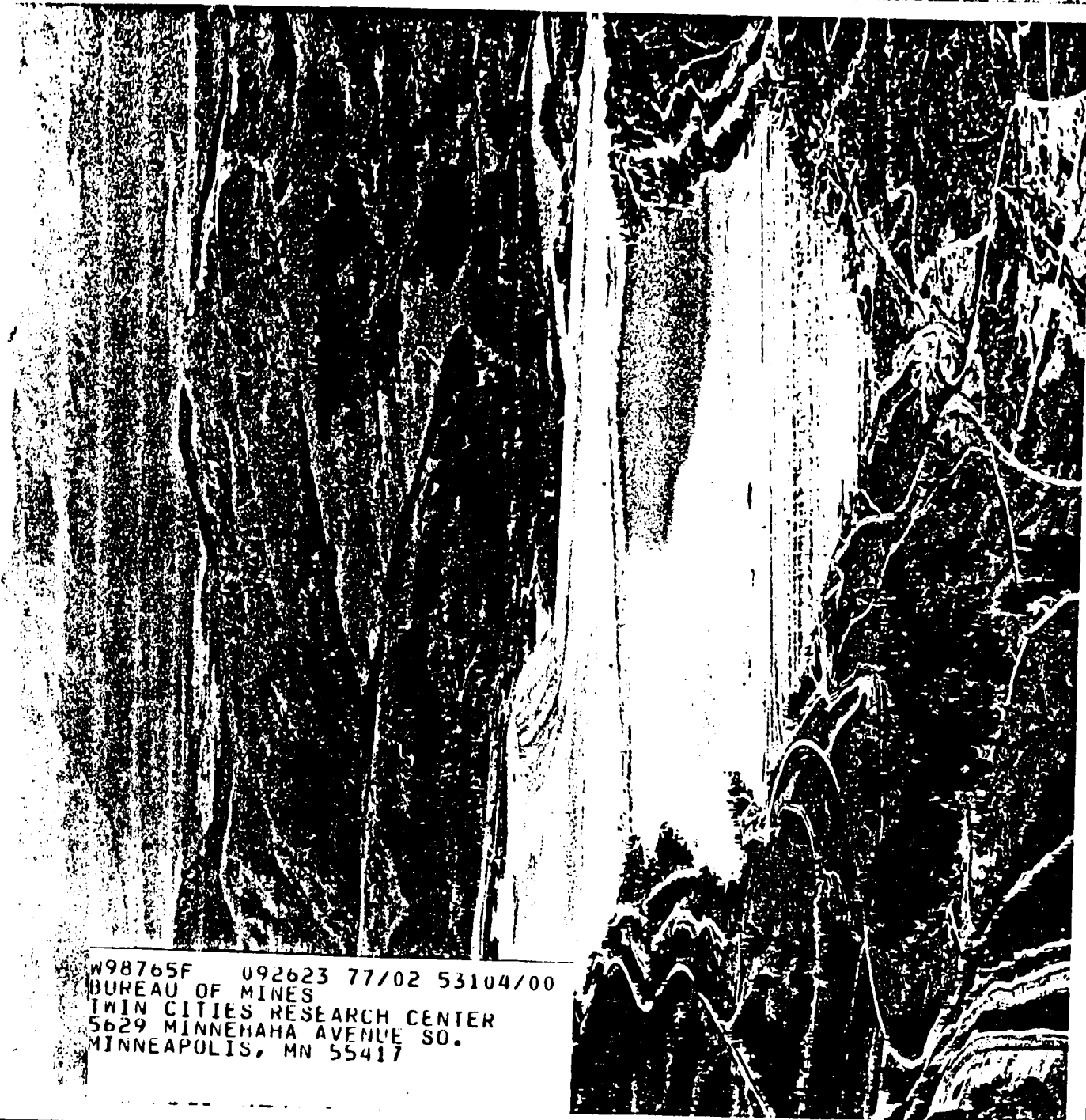
Minneapolis, Minnesota

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Mine Waster: Where Is It Headed?

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COVER: This Western state's tailings pond is one example of a site-specific method used by a mining company to control conventional wastes from minerals processing. Whether the disposal of these wastes will be regulated by the states or the federal government is discussed in this issue. See page 6.

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Industry Has a Lot Riding On Mine Waste Debate

What role should the federal government play in regulating mine waste? That's an issue that the government will try to resolve in the coming months. It is a subject of intense interest at the Environmental Protection Agency and of major concern to the American mining industry. The following report discusses in detail how mining waste came to be the focus of federal concern, delves into the status of developing a regulatory effort and discusses upcoming events that will shape the government's approach to this issue.

By Doug McAllister and Rod Dwyer

THE PRODUCTION of metals and minerals is one of the most basic industries in the United States and has been important to this country since Colonial times. Literally billions of dollars worth of metals have been mined, milled, smelted and refined in the U.S. over the years, providing basic materials for this country's rise to preeminence among the industrial nations of the earth. To produce such wealth, however, billions of tons of waste rock and tailings have been generated.

Today, less attention is being paid to the value of minerals being produced than to what should be done with the resulting solid waste. Mining waste and the way it is managed are unique in many respects. In 1986, the U.S. Environmental Protection Agency (EPA) reported:

- **Volume:** Approximately 50 billion metric tons of solid waste have been generated by nonfuel mining since 1910. The annual volumes generated are considerably larger than those for industries currently subject to hazardous waste controls. For example, the mining industry alone generates over 1 billion metric tons of waste per year compared to 260 million tons by all hazardous waste industries combined. The average mining waste facility manages about 3 million tons of waste per

year compared to about 50,000 tons by hazardous waste facilities.

- **Disposal:** Generally, mine waste disposal facilities are much larger than hazardous waste facilities in other industries. Mine waste piles average 126 acres (the largest exceeding 500 acres); tailings impoundments average 500 acres (the largest exceeding 5,000 acres). By comparison, industrial hazardous waste impoundments average only about 6 acres and landfills about 10 acres.

- **Offsite Shipment:** About 70 percent of hazardous waste generators ship all of their wastes offsite. No mines do likewise. Less than half of all industrial waste is land disposed, while nearly all mining waste is disposed in landfills.

'The stakes are high for the mining industry with respect to the mine waste issue.'

- **Health and Environmental Damage:** Generally, environmental conditions and exposure potential are different from those associated with industrial hazardous waste streams. Compared to industrial hazardous waste facilities, mining waste sites are usually in drier climates having less potential for leaching contaminants into ground water, are farther from ground water and from drinking water receptors and are located in less densely populated areas.

Early on, Congress showed its awareness that mining waste was different from other wastes. In its 1976 passage of the Resource Conservation and Re-

covery Act (RCRA), Congress directed EPA to study any adverse effects from, and current disposal practices, for mining waste—presumably to guide the agency in developing appropriate regulations. EPA did not produce this study, however, but instead issued regulations in 1980 under Subtitle C of RCRA (the hazardous waste provisions of the statute) covering, among other things, mining waste.

Just before these regulations became effective, Congress—in response to the petitioning efforts of the American Mining Congress and other industry groups—enacted amendments to RCRA that prohibited EPA from regulating under Subtitle C the "solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore" until at least six months after completing an expanded study of such wastes and submitting a report to Congress. EPA was directed to make a "regulatory determination" within six months after submission of the study as to whether mining waste should be regulated as hazardous waste. This exclusion of mine waste from regulation pending a study became known as the "Bevill Amendment" named after its sponsor, Representative Tom Bevill (D-AL).

In December 1985, EPA submitted a Report to Congress on extraction and beneficiation wastes from a number of mineral sectors, including copper, lead, zinc, gold, silver, phosphate, asbestos, oil shale and overburden from uranium mining. The report included findings about the relative hazards of mine waste to health and the environment as well as estimates of the costs of regulat-

Doug McAllister is the AMC Vice President responsible for environmental issues. Rod Dwyer, AMC Senior Counsel, has the specific responsibility for mine waste issues.

ing mine wastes under Subtitle C. AMC fielded a cadre of witnesses at EPA's public hearings on this report and submitted extensive written comments to the agency.

Under EPA guidelines, solid wastes are defined as hazardous and hence subject to Subtitle C of RCRA if they exhibit any of four general characteristics: ignitability, corrosivity, reactivity, or EP toxicity (i.e. toxic according to an EPA-designed "extraction procedure" test). Wastes also are considered hazardous if they are "listed" as hazardous, which involves a regulatory decision by the EPA Administrator that a waste meets any one of certain specified criteria. Because of the Bevill Amendment, EPA's current list of hazardous wastes does not contain any wastes from mining and milling.

In its study, EPA did not examine mining waste for ignitability or reactivity because of the unlikelihood that these wastes would display such characteristics. Focusing on corrosivity and EP toxicity, EPA stated in its Report to Congress that, of the 1 to 2 billion metric tons of waste generated by extraction and beneficiation operations per year, more than 95 percent was not hazardous under the agency's characteristics test.

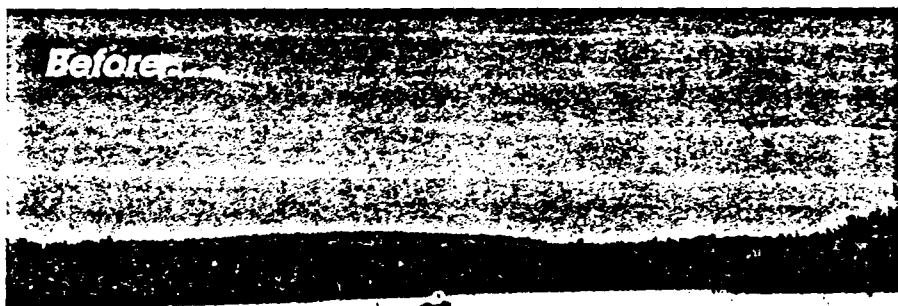
Later, the agency admitted that its EP test tended to overstate the potential danger to human health and the environment from those wastes. The American Mining Congress, the U.S. Bureau of Mines, the University of Missouri's Rolla Environmental Research Center and others have shown that EPA's EP test, which was designed to simulate disposal in municipal landfills containing household garbage (not waste rock piles or tailings ponds), causes significantly higher percentages of metals to leach from mining wastes than would occur under real conditions. When EPA ran a modified toxicity test that more accurately predicted real conditions, all 214 sample extraction and beneficiation wastes passed.

In discussing whether leaching from extraction and beneficiation disposal sites posed any environmental or health hazards, the EPA Report to Congress noted that metals of concern did not appear to have migrated at these sites during the six- to nine-month period of the agency's monitoring study. The U.S. Bureau of Mines concluded in its public comments that the data in the Report did not establish a linkage between mining waste disposal practices and offsite health and environmental effects. Addi-

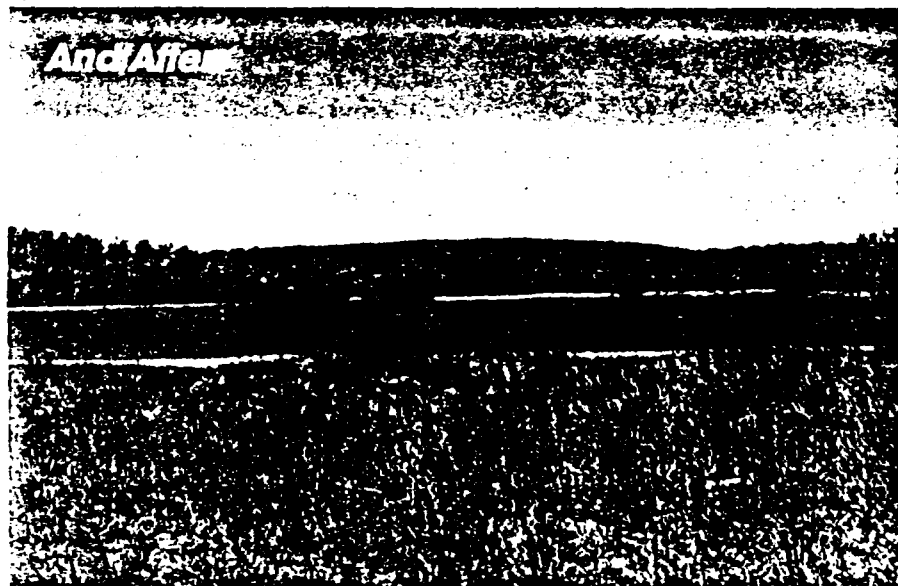
tionally, AMC retained the Gradient Corporation to conduct a thorough review of public literature on health effects of mining waste. The study found that there were no cases of proven community health effects related to mining industry wastes.

Costs were another issue. EPA's 1985 Report to Congress estimated total annualized costs for five metal mining segments to run from \$7 million per year (for a scenario that emphasizes primarily basic maintenance and monitoring for wastes that are hazardous under the current RCRA criteria) to more than \$800 million per year (for a scenario that approximates a full RCRA Subtitle C regulatory approach, emphasizing cap and liner containment for all wastes considered hazardous under the current criteria, plus cyanide and acid formation wastes).

Economic Consulting Services Inc., AMC's economic consultant retained to evaluate the EPA study, drew several conclusions despite the wide variations in the agency's cost estimates. For one thing, six out of the eight regulatory regimes reported in the EPA study would result in substantial compliance costs, with the aggregate net present value ranging from \$300 million to \$5.7 billion for the copper, lead, zinc, gold and silver industries. Under these six regulatory scenarios, compliance costs would lead to at least a 10-percent increase in direct production costs. Moreover, AMC's comments detailed serious cost omissions and questioned the reliability of EPA's underlying economic data on the industry. These deficiencies, according to the ECS study, lead to the likelihood that EPA seriously underestimated the real world com-



The Federal Division tailings area, owned by the St. Joe Minerals Corporation in the Flat River area of Missouri, is shown above in September 1972 at the time of seeding, after lead mining had ceased. Below is a photo taken from approximately the same spot in April 1984. In 1976, St. Joe donated the property to the state of Missouri for use as St. Joe State Park, about 25 percent of which is underlain by mined areas.



pliance costs of a Subtitle C regulatory scheme to the industry.

The EPA study underscored the point that the stakes are high for the mining industry with respect to the mine waste issue. Some segments of the industry just now are emerging from the longest and deepest recession in the history of American mining. Additional regulatory costs attributable to a federal mine waste regulatory program inevitably will raise the price of domestic minerals, making them less competitive with foreign products. Metals are traded in an international marketplace with any one producer having no control over price. Hence American producers cannot pass on costs of production to their customers, but continually must seek efficiencies in production to remain competitive.

EPA issued its required regulatory determination, declaring that the wastes that were the subject of the study would not be regulated under RCRA Subtitle C as hazardous waste.

'EPA specifically stated that it needed no additional legislative powers to develop an adequate regulatory program.'

In discussing the potential hazards of mining waste, EPA admitted that its Report to Congress had overstated substantially the amount of waste that failed the characteristic test (by more than 50 million metric tons). The agency concluded that extraction and beneficiation wastes generally have lower exposure and risk potential than industrial hazardous waste streams regulated under Subtitle C because most mining waste disposal sites are located in drier climates, farther from population centers, and farther from ground-water and drinking-water receptors than industrial hazardous waste sites.

Rather than regulate mine waste under Subtitle C, the agency decided to develop a separate mine waste management program under Subtitle D, the solid (non-hazardous) waste provisions of the statute. This subtitle relies heavily on state programs to regulate solid waste disposal. EPA expressed concern, however, with its own lack of oversight and enforcement authority under Subtitle D and inadequate state resources to develop and implement mine waste programs. The agency, therefore, stated that it would work with Congress to develop the necessary authority. EPA said it would consider returning to a Subtitle C approach in the event an adequate Subtitle D program could not be developed.

In mid-1986, EPA embarked on a program to implement its regulatory determination. The agency held a series of open meetings with industry, environmental groups and state representatives to discuss a plan to develop a

Tour Educates Hill Staff on Mine Waste

ANYONE SEEING seven men and women emerging from a mine cage wearing hardhats, knee-high boots and self-rescuers probably wouldn't guess that their usual beat was the halls of Congress. But this first-hand examination of Doe Run Company's Casteel lead mine was only one stop in a five-day tour of mines from the Missouri lead belt to the gold mines of Nevada.

AMC sponsored a Congressional staff mine waste tour in August that was designed to educate key staff members about the needs and realities of mining and the management of mine waste. The effort, which was conceived and implemented by AMC's Solid Waste Subcommittee and a group of host companies, was made in anticipation of Congressional reauthorization of Subtitle D of the Resource Conservation and Recovery Act in 1988. The project was spearheaded by the Subcommittee Chairman, David Crouch, from Homestake Mining Company.

Learning about mining from the ground up (and down) were Bruce McKay, Legislative Assistant for Senator Quentin Burdick (D-ND), who is Chairman of the Environment and Public Works Committee; Lisa Vehmas, staff member on the Senate Energy and

Natural Resources Committee; Dave Eck, Legislative Assistant for Representative Dan Schaefer (R-CO), who is on the Energy and Commerce Committee; Chris Donnellan, then-staff member on the House Interior and Insular Affairs Committee; Jeanne Hesse, Executive Assistant to Representative Bill Richardson (R-NM), a member of the Interior and Insular Affairs Committee and the Energy and Commerce Committee; Ginny Graybill, Legislative Assistant to Representative Terry Bruce (D-IL), Energy and Commerce Committee; and Robert Bergman, Associate Minority Counsel, House Energy and Commerce Committee.

After touring Doe Run's Casteel mine and Buick mill, the group moved on to Colorado and Amax Inc.'s Henderson molybdenum mine. While there, they visited the innovative reclamation project at nearby Urad mine. The now-closed operation's tailings ponds were reclaimed by Amax, using three major waste products: waste rock from Henderson; sewage sludge from Denver and waste wood chips from a sawmill in the area.

From Colorado, the staffers and their hosts flew on to Utah, where they visited the world's largest man-made hole—Bingham Canyon mine. The



A waste rock dike is examined at Bingham Canyon mine in Utah.

group found the mountaintop views of the mine, the leaching operations and the tailings ponds "extraordinary and educational." Kennecott's \$400-million renovation project was very much in evidence as they toured the mill and smelter, as well.

The final destination was Nevada and its gold mines. Newmont's Carlin mine and mill near Elko was visited one day, and Smoky Valley mine, owned jointly by Echo Bay Mines, Ltd., Homestake and Case, Pomeroy and Company,

Subtitle D mine waste program. EPA is committed to develop a *federal* program, although agency staff repeatedly declare that they have no wish to displace state programs that, in EPA's terms, are "working."

AMC has maintained consistently that the need for a federal program has not been demonstrated clearly, that the states are the current and logical regulatory powers and can improve their own regulatory systems, where necessary, with technical and financial assistance from EPA.

In July 1987, EPA released a mine waste management plan. The plan projects that the first mine waste rules will be proposed in April 1989. Extraction and beneficiation wastes from copper, lead, zinc, gold, silver, phosphate, asbestos and uranium mining operations will be addressed. Final rules are expected a year later.

How have the states handled the mine waste issue? While almost every



This tailings pond is a typical method used by mining companies for waste management. Mining waste sites usually are in drier climates having less potential for leaching contaminants into ground water, are farther from ground water and from drinking water receptors and are located in less densely populated areas.

Realities

was toured the next. Both operations use a leaching process for gold recovery, which was of particular interest to the Congressional staffers. They were shown the many environmental controls, including the program of "zero discharge" from the leaching process.

THE TOUR WAS viewed as a success by industry and legislative participants alike, leading to the recommendation that similar tours be conducted in the future to continue the essential education of government policymakers about mining concerns.

One of the participants, Bob Bergman, commented on how beneficial it was to observe first-hand "the measures being taken by the mining industry to protect the environment, under supervision of state regulatory agencies." He also thought the trip valuable "from the standpoint of learning about the business and economics of the mining industry. When we in Washington make decisions without understanding how a business operates, we are making uninformed decisions. I think it's important for us to get out of Washington and meet the people who meet the payrolls and make the products that are vital to us."

state with any significant mining activity has an established regulatory program that addresses many, if not all, mining waste concerns, the states frequently have divided mining waste regulatory authority among several agencies. For example, Colorado has three such agencies: the Colorado Health Department's Water Quality Control Division and Hazardous Materials & Waste Management Control Division, and the Mined Land Reclamation Board under the Department of Natural Resources.

At least seven states (Missouri, Nevada, Wyoming, Montana, Colorado, Minnesota, and Washington) have sent representatives from state agencies having regulatory authority over mining activities to EPA's public meetings on developing a mining waste management program. Despite the sometimes fragmented state regulatory approaches, state representatives at the EPA meetings generally have viewed the federal agency with some misgivings. While state representatives gladly would take EPA financial assistance and technical support, the state officials do not appear to accept EPA domination in mine waste regulation.

The states' reluctance could be attributed to several reasons. The states generally view the EPA hazardous waste program as inflexible, because it requires states to adopt and enforce rules at least as stringent as EPA rules. Some states also wish to avoid repeating their experience in regulating coal mining under the Surface Mining Control and Rec-

lamation Act, in which the federal Office of Surface Mining is perceived as dictating what requirements states must enact and enforce. (Montana has been particularly vocal on this latter point.) In addition, the National Governors' Association and organizations of state environmental officials have stepped up

'State officials do not appear to accept EPA domination in mine waste regulation.'

their call this past year for EPA to adopt more flexible regulatory approaches to recognize the right of states to develop regulations appropriate to their own needs, and to support the states with financial and technical assistance.

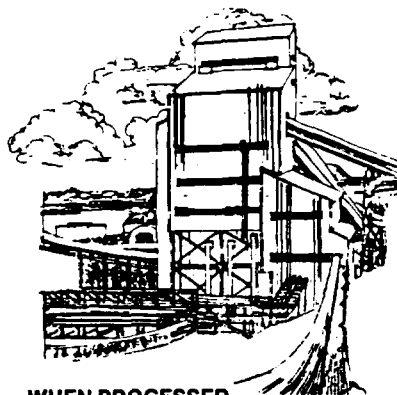
What's the outlook for processing wastes? About the time in 1985 that it was completing its Report to Congress on selected mining wastes, EPA proposed for comment a reinterpretation of the term "processing" in the Bevill Amendment. Under the proposal, only "high-volume, low-hazard" wastes from industry processing operations would be subject to the Bevill exclusion. EPA proposed not to study, but to list as hazardous six smelting waste streams from the primary copper, lead, zinc, aluminum, and ferroalloy industries that it considered inconsistent with the "high-volume, low-hazard" rationale.

In October 1986, EPA withdrew its proposed reinterpretation of the Bevill

WHEN YOU MINE METALS, HERE'S WHAT YOU GET ...



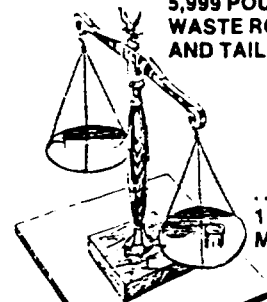
... 6,000 POUNDS OF MINED MATERIAL ...



WHEN PROCESSED YIELDS ...



5,999 POUNDS WASTE ROCK AND TAILINGS



... AND ... 1 POUND OF METAL

This rate may vary with difference in ore grades.

Amendment, citing the lack of appropriate definitions of the terms "high-volume" and "low-hazard" and the difficulty in classifying specific wastes. The agency announced its intention to proceed, as Congress had directed, with studies under RCRA for processing wastes affected by the Beville Amendment and issue appropriate regulatory determinations on them.

The Environmental Defense Fund, unhappy with EPA's decisions not to

regulate mining waste under Subtitle C and to withdraw its reinterpretation of the Beville Amendment, filed suit challenging both decisions in the U.S. Court of Appeals for the District of Columbia Circuit. The Hazardous Waste Treatment Council, an association of waste disposal companies, also challenged the latter decision. The American Mining Congress, the Aluminum Association, the Fertilizer Institute, Kennecott and the Idaho Mining Association inter-

vened in these suits to help preserve the two favorable agency decisions. Victory by EPA would allow the agency to continue on its present course. Defeat could subject industry wastes to Subtitle C regulation.

The two cases were set by the D.C. Circuit on identical schedules. Briefs are being filed this fall and oral argument is scheduled for December 11, 1987.

In the months ahead, EPA is expected to submit two more Reports to Con-

AMC Committees, Staff Actively Involved in Mine Waste Issue

From the Chairman of the Board on down, AMC is focusing on the mine waste issue. Overall policy direction is provided by a three-member subcommittee of the Board of Directors, chaired by Harry M. Conger, Chairman and Chief Executive Officer of Homestake Mining Company and Chairman of the American Mining Congress. Also



CONGER



MUTH

serving on this subcommittee are Richard de J. Osborne, Chairman and President of Asarco Incorporated, and George D. Kennedy, Chairman of International Minerals and Chemical Corporation.

Governmental affairs work with Congress, the Administration and the Environmental Protection Agency on the mine waste issue is the pri-

mary responsibility of the AMC Washington Mine Waste Group, headed by Robert J. Muth, Vice President-Government and Public Affairs, Asarco Incorporated. The Washington Mine Waste Group is composed of Washington representatives and governmental affairs personnel primarily from metal and industrial and agricultural mineral member companies of AMC.

The technical, scientific and legal aspects of the mine waste issue are the principal focus of the AMC Solid Waste Subcommittee, chaired by David B. Crouch, Corporate Manager-Environmental Affairs, Homestake

Mining Company. This subcommittee, formed soon after passage of the Resource Conservation and Recovery Act in 1976, has commented on all EPA actions on solid and hazardous waste affecting mining, testified at agency hearings and directed industry research on mining waste problems. Members of the subcommittee are chiefly engineers, attorneys and specialists in a wide variety of environmental disciplines.

AMC staff responsibilities for mine waste fall upon AMC Vice President Doug McAllister, Senior Counsel Rod Dwyer and Assistant to the President Ric Fenton.



Mine Waste Subcommittee Chairman Dave Crouch (r) confers with AMC staff members Doug McAllister (l) and Rod Dwyer.

gress relating to the mining and processing of ores and minerals. In January 1988, the agency plans to complete a study and report on processing wastes from smelting and refining operations. By law, the agency will hold public hearings on the report and, in mid-1988, make a regulatory determination on whether the wastes covered should be regulated as hazardous. In January 1989, EPA is scheduled to submit to Congress another report covering extraction, beneficiation and processing wastes not addressed in earlier reports. The same process, involving public hearings, written comments and a regulatory determination, will be repeated.

What's ahead for Congress? The

Resource Conservation and Recovery Act must be reauthorized in 1988. There is concern in the industry that anything more than a simple reauthorization effort could result in the enactment of detailed mine waste management provisions. After all, in the 1984 reauthorization of RCRA Congress passed regulation-like requirements for Subtitle C wastes.

The extent of Congressional interest in a detailed consideration of RCRA in 1988 is not clear at present. Few hearings have been held to date, and those have focused on such general topics as waste recycling and minimization. The chairman of the House subcommittee having RCRA jurisdiction asked EPA

for legislative recommendations; EPA's recommendations were not ambitious. The agency suggested a few possible amendments, none being of direct interest to the mining and mineral processing industry. Speaking of mining wastes EPA specifically stated that it needed no additional legislative powers to develop an adequate regulatory program.

Speculation on RCRA reauthorization runs the gamut from a continuing resolution (i.e. "no change") to a full-fledged overhaul of Subtitle D, including giving EPA oversight and enforcement powers that it is currently lacking. One fact is certain: AMC intends to be a player in further developments in this vital matter.

AMC

Court to Decide Mine Waste Cases

Two key cases on the regulation of mine waste are before the U.S. Court of Appeals for the District of Columbia Circuit. Decisions are expected by mid-1988. The arguments made in briefs to the court for one case—Environmental Defense Fund v. Environmental Protection Agency—are summarized below:

Here's How EPA Sees It

- EPA decided on June 30, 1986, not to regulate certain mining and milling wastes as hazardous under Subtitle C of the Resource Conservation and Recovery Act (RCRA). The EPA's decision was based on consideration of all the relevant factors in RCRA Section 8002(f) and (p), including cost and feasibility of disposal methods, as well as on public comments and EPA studies. Whether a waste is hazardous is not the sole consideration. EPA properly exercised the broad discretion given by Congress, and its decision should receive substantial deference by the court.
- EPA sees mining waste as significantly different from industrial hazardous waste currently regulated under Subtitle C, which limits the agency's ability to design appropriate regulations for mine waste. Section 3004(x) authorizes EPA to modify some, but not all, Subtitle C requirements, but it may not allow EPA to consider cost impacts.
- EPA sees its decision not to use Subtitle C as reasonable. It is revising its Subtitle D regulations to develop a strong regulatory program for mine waste. Meanwhile, sufficient authority exists to protect the environment—EPA can bring suit under RCRA Section 7003 for threats of imminent and substantial endangerment to health and the environment; Superfund powers could be used; and private citizens can bring suits under RCRA and Superfund for violations of permits or standards or under Subtitle D for violation of open dumping provisions.

Here's How EDF Sees It

- EDF filed suit, asking the court to set aside the EPA decision of June 30, 1986, and order a rulemaking to determine what Subtitle C standards should apply to mining wastes considered to be hazardous.
- EPA failed to comply with RCRA, says EDF. The law requires that any waste exhibiting a hazardous waste characteristic (ignitability, corrosivity, reactivity or extrac-

tion procedure toxicity) must be regulated as a hazardous waste under Subtitle C. EPA, in its study, found certain mining wastes to be hazardous but then ignored its statutory mandate and exempted all mining waste from Subtitle C.

- Section 3004(x) gives EPA sufficient flexibility to tailor Subtitle C requirements to fit the special characteristics of mine waste. EPA's inability to justify modifying Subtitle C requirements for mining waste simply proves the need for Subtitle C mine waste controls.
- EDF holds that EPA has no regulatory power under Subtitle D to enforce mine waste controls on the industry.

Here's How AMC Sees It

- AMC, Kennecott, the Fertilizer Institute and the Idaho Mining Association intervened in the suit in support of EPA's decision, which, they hold, is based on factors in RCRA Section 8002 (f) and (p). The statute and legislative history require that all factors be considered, not just whether a waste is "hazardous." Because Congress expressly delegated to EPA responsibility for making the determination, the agency's decision is entitled to great deference from the court.
- EPA's decision is supported fully by the public record, according to AMC. The record shows that the studied wastes pose little or no threat to the environment or to public health, that Subtitle C controls are technically infeasible for these wastes and would be so costly as to be impractical, that state and federal programs already in place regulate these wastes, and that EPA is developing a Subtitle D regulatory program for those wastes that warrant it.
- EPA did not base its decision on whether it had sufficient authority to fashion a flexible Subtitle C program, says AMC, but rather on the factors in Section 8002 (f) and (p).

Cooperative Effort Produces Workable Cyanidation Rules

By Jack G. Peterson

WRITING A STATE mine waste law acceptable to industry and environmental groups is not an impossible task. Take the case of Idaho and its Rules and Regulations for Ore Processing by Cyanidation.

In a cooperative, proactive effort, the Idaho Mining Association, together with the Idaho Division of Environment, the Idaho Conservation League and the U.S. Environmental Protection Agency, developed a set of Health Rules and Regulations for Ore Processing by Cyanidation and sent them to the Idaho Health Board last month. The same coalition received overwhelming approval last March from the Idaho legislature for the cyanide rulemaking effort in the form of statutory authorization—and a commendation from Idaho's Governor.

Idaho's new cyanide rules are the first in the western states to establish engineering, operating, water quality monitoring and reclamation standards for precious metals cyanidation, especially heap leach operations.

The rules are site specific. Flexibility was required in order to accommodate Idaho's wide variations in terrain and climate. Currently there are two operations at between 6,000 and 7,000 feet elevation. Both are seasonal, operating some seven months of the year. When decommissioned during the winter, the operations often are covered by 15 to 20 feet of snow. Here, protecting the receiving surface water during spring snowmelt is a major consideration.

Another year-round operation is un-

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PETERSON: 'Grassroots Effort'

der construction at a similar elevation that experiences only 3 to 5 feet of snowfall per year. Here, protection of ground water is a major consideration.

Key to protecting both surface and ground water is the engineering of pads and containment structures and design of the monitoring system. Again, the

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actual engineering design and monitoring requirements in the new rules are based on the site-specific conditions.

In summary, the rules assure that

minerals development can proceed with certainty and in an economically sound manner while water quality is given maximum protection.

Some have asked: why the rigorous approach? Many of Idaho's rivers are of nationally renowned quality, for example, the Salmon, Payette, Clearwater, St. Joe, St. Maries and the headwaters of the Snake. Several are National Wild and Scenic Rivers. Idaho also has several Wilderness Areas and National Recreation Areas. Virtually all of these sensitive designated areas or rivers are adjacent to highly mineralized areas or currently active mining operations. In order for both activities to coexist, cooperation is a necessity.

The effort was not limited to the Idaho Mining Association, Idaho Division of Environment, Idaho Conservation League and Environmental Protection Agency. The U.S. Forest Service, U.S. Bureau of Land Management, Idaho Department of Fish and Game, Idaho Department of Lands and Idaho Department of Water Resources and the Du Pont Company also joined the roundtable effort that became known as the Idaho Cyanide Technical Advisory Committee.

The binding force that brought everyone to the table and kept them there was a common interest in protecting Idaho's high quality waters. An interesting aspect of the effort is that it was initiated by the mining industry.

THE PROCESS began in September 1984 when the Idaho Mining Association asked the Idaho Division of Environment and EPA's State Operations Office to sponsor jointly a Technical Seminar on Cyanide and Mining for their respective Idaho constituencies. They agreed. Speakers

were identified—engineering, consultants, aquatic biologists, federal and state agency experts and manufacturers of cyanide. A day-long agenda was set. Invitations went out.

The consensus of the sponsors on the eve of the seminar was that seating should be available for 35 to 40 participants. The next day over 125 interested participants showed up from four states. The director of Idaho's Division of Environment commented dryly that "we appeared either to have struck a chord of common interest or people were at the wrong meeting."

That 1984 beginning was prologue to a cooperative technical drafting and negotiating process that was initiated formally in late 1985 and continued throughout 1986. The result was a consensus set of Rules and Regulations for Ore Processing by Cyanidation to which Idaho's mining industry devoted its best technical and public policy efforts. So, too, did the other participants.

It wasn't the first time this coalition had worked together, but it was the most recent and perhaps the best.

Earlier legislative and rulemaking efforts in Idaho in which these organizations and others have worked together include upgrading Idaho's Surface Mining and Reclamation, Dredge and Placer Mining, and Environmental Protection and Health statutes. The same coalition also wrote Idaho's Hazardous Waste Act in 1983 and restored Idaho's Air Quality Program in 1982.

At the direction of Idaho's Governor, the Idaho Mining Association currently chairs the Idaho Emergency Response and Community Right-to-Know Commission under Title III of the new federal Superfund Amendments and Reauthorization Act of 1986. In early 1987, the association completed chairing the Idaho Hazardous Waste Management Planning Commission, which, during a year-long effort, produced one of the first state hazardous waste management plans in the West. That plan was adopted unanimously by the 1987 Idaho legislature.

In summary, the Idaho cyanide effort didn't just happen—nor was it a coincidence. It was a true grassroots effort with everyone in Idaho accepting equal responsibility for its success and ownership of the final product. Taking the initiative is a time-consuming, challenging and oftentimes risky way of doing business. It is hard work. It is also a positive way for the minerals industry to be a valuable participant in developing sound public policy.

How 3 States Manage Mine Waste

What are other states doing about mine waste regulations? Here are reports from three states—Missouri, Oregon and Arizona—that provide strong indication that the states are capable of regulating wastes without having "the federal government . . . tell us what to do," as one Arizona official said.

- **Missouri:** The Missouri Department of Natural Resources (MDNR) Mine Tailing Task Force has issued its report, *Missouri Guidelines for Management of Mine Tailings*, imposing detailed recommendations on (1) proper procedures for siting new lead mine tailings disposal areas, and (2) criteria for active site containment control. The report also outlines geological considerations in siting tailings ponds and sets dam safety requirements for new lead mine tailings disposal operations.

For new tailings locations, the report starts from the principle that the site is governed by the orebody location. The operator should provide a site-specific engineering and geological plan for each proposed site. Additional factors to be assessed in an engineering report include: potential land use at the end of the operation, a ground water monitoring program, soil and dam site evaluations, wind erosion controls and storm water run on/run off controls.

For existing sites, the Task Force report recommends: hydrogeologic characterization of the site, a ground water monitoring plan, a surface water monitoring plan, a permit for all discharges, storm water run on/run off storage or treatment and discharge, an assessment of air quality, a dam safety permit under the Missouri Dam Safety Law and site security to protect public safety and limit access to the site.

The Task Force was chaired by Professor Bobby G. Wixson of the Engineering Research Laboratory at the University of Missouri-Rolla. The Task Force included personnel from the lead mining companies, as well as eight state government officials representing the MDNR; the Air Pollution, Water Pollution, Land Reclamation, and Dam and Reservoir Safety Programs; and the state Departments of Health and Commerce.

- **Oregon:** On July 16, 1987, Oregon enacted a law regulating precious metal leaching operations that requires such operations to furnish an additional reclamation bond (beyond any already required under existing law). The maximum amount of the new "leaching reclamation" bond is \$500,000. The new law also amended the definition of "reclamation" to include not only surface mining operations, but also any "surface mining processing operation, including cyanide leaching or any other chemical leaching processing" The law took effect immediately.

- **Arizona:** In 1986, the state enacted a sweeping ground-water quality control law that applies to all industry in the state. The law requires existing and new operators to obtain a state permit based on use of Best Available Demonstrated Control Technology (BADCT). The state now is preparing a series of guidance documents on BADCTs appropriate to particular industry sectors, such as copper mining and processing.

Development of the guidance documents is a multi-party effort. Arizona copper companies have had an opportunity to contribute to the preparation of the document on copper. Some of the BADCTs could apply to both new and existing operations, while others would be more appropriate only for new facilities. While there may be some room for negotiation in the permit process, it seems clear that the permit applicant will bear the burden of proving the adequacy of the selected BADCT.

In a related matter, the Arizona Department of Environmental Quality (DEQ) will enforce the new ground-water statute. It now has an annual budget of \$30 million and 350 employees. DEQ's responsibilities include waste management, air and water quality, emergency response efforts and environmental analyses. A DEQ spokesman said that the reason for the large budget and number of employees is to enable the state to handle its own environmental problems "so the federal government doesn't have to come in and tell us what to do."

Mine Waste Management Is a Problem All Over

By Judy Kowalski

APPROACHES TAKEN by different countries to regulate the environmental effects of mining wastes are as diverse as the minerals mined. Methods range from legislation denoting specific environmental considerations to general environmental statements included in a country's mining laws.

In most industrialized countries, solid waste issues have been studied in depth and appropriate policies have been designed to mitigate negative impacts. Along with the United States, countries particularly advanced in this area are Sweden, Denmark, the Federal Republic of Germany and Japan. These countries have strong national programs to manage environmental problems and to undertake research and development on mitigative practices. For example:

- In Japan efforts began in 1967 with the enactment of the Basic Law for Environment Pollution Control, which led to the development of effluent standards for numerous substances and requirements for environmental impact assessments. Additionally, the Metal Mining Agency of Japan undertakes technical studies to solve mining-related pollution problems, such as tailing and waste dam stability, and provides loans to mining companies for pollution control and restoration activities.
- In some countries, the federal government defers primary responsibility to the states for control of environmental problems related to mining. Such is the case in Australia, where the bulk of environmental legislation has been produced at the state level, as a result of the division of constitutional powers under the *Commonwealth of Australia Constitution Act 1901*. Each state or territory has enacted its own environmental and/or mining laws to conform to specific policies or local characteristics. Environmental legislation at the Commonwealth

level generally has been restricted to requirements for environmental impact assessment, nature conservation and "heritage protection."

The main focus of state regulations in Australia is reclamation and dust control, with concern aimed at the resource user rather than the resource itself. Cooperation between the Commonwealth and state governments takes place through joint organizations that undertake research in environmental matters. Most states also have tribunals

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comprised of both lawyers and non-lawyers to review the merits of administrative decisions.

- Some countries have regulations specifying certain review procedures. In Canada, mine plans must be submitted to an independent group to determine the adequacy of measures to be taken to protect the environment. A separate waste management permit must be obtained, which specifies annual environmental assessment reports. Permits often contain provisions requiring monitoring by an independent party to assure proper operation of tailings disposal and other waste management.
- In developing countries with long histories of mining, environmental regulations are generally relatively stringent, but are often flexible. Most require an environmental impact statement (EIS) in the least. In the Philippines, Presidential Decree 463 requires that mine operators "utilize in their exploration, development and exploitation activities the most modern methods and devices to prevent wastes, or from causing pollution or otherwise damaging streams and surface or underground water supply."
- In Chile, the government has promulgated a law entitled "Neutralization of

the Residues Emanating From Industries," which specifically prohibits mining and metallurgical establishments from using, for tailings disposal purposes, "natural or artificial waterways that carry water for drinking or irrigation." The detailed regulatory guidelines often are developed on a site-specific basis.

In some developing countries, the approach to environmental protection is more haphazard. Large-scale mining projects designed and constructed by international consulting engineers normally use the most modern technologies. Foreign investors, both private and institutional, are interested in avoiding environmental damage to as large an extent as possible. Where detailed regulations do not exist, U.S. or West German regulations often are used as a guide for mining projects. Actual written environmental regulations, however, may be limited to general expressions of concern to protect the environment from the negative effects of uncontrolled development.

- The most noted recent examples of environmental damage from mining wastes can be found in the developing countries. In May of this year, toxic wastes from two silver mines in Mexico were reported to have depleted wildlife and vegetation along two rivers there and infected rural residents relying on the waters for cooking, cleaning and irrigation. In Malaysia, residents of a local community staged a protest against improper dumping of wastes from the production of rare earths that are believed to be radioactive. In such cases, the reaction of the government is often merely to suspend production until the problem can be corrected.

Such examples of severe environmental damage from mining wastes are found rarely in the industrialized countries, where mining is already a strictly controlled industry. As economic conditions improve and technical knowledge is gained, it is likely that developing countries will become more advanced in the protection of the environment. *AMC*

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